REMARKS/ARGUMENTS

Claims 3-5, 7-11 and 16-22 are pending.

EXAMINER INTERVIEW

Applicants thank the Examiner for the courtesy extended during a telephone interview held on February 28, 2006 with Applicants attorney, John Shimmick. The participants discussed the obviousness-type double patenting rejections of items 11-15 in the November 16, 2005 Office Action. Agreement was reached that these double patenting rejections would be removed upon Applicant providing information showing that the present application is assigned to United Module Corporation. No agreement was reached on the allowability of any claims.

REJECTIONS UNDER 35 U.S.C. § 112

Claims 3-5, 7-11 and 19-22 were rejected under 35 U.S.C. § 112 as allegedly failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. These rejections are respectfully traversed as follows.

In claim 3, use of the term "uniform" to describe both the "uniform" impact energy and "uniform" weight of ions in the stream was objected to as allegedly being vague and indefinite under § 112. Applicants respectfully disagree. The applicable standard is whether the claims have a **reasonable degree** of particularity and distinctness, not whether more suitable language or modes of expression are available. MPEP § 2173.02. As the Examiner certainly knows some latitude in the manner of expression and aptness of terms is permitted, and the Examiner is not to reject the claims so long as the statutory requirements are met. Id.

Applicants respectfully submit that the term "uniform" is used throughout the application so that one possessing ordinary skill in the art would know to a reasonable degree of particularity and distinctness what is meant by the term "uniform" in claim 3. For example, the term "uniform" is used in paragraphs 14, 16, as pointed out by the Examiner, and additionally in paragraphs 21, 45, 68 and 70. With respect to uniformity of energy, Fig. 3F and the associated text in paragraph 60 shows that the ion energy distribution varies linearly with pressure and that the ion energy distribution of the plasma beam is "quite sharp, with a width of approximately 5%

about the bias voltage." With respect to uniform weight, the present application categorizes hydrocarbon ions by species (e.g. C2, C4, etc.), so that uniform weight refers to the ion species which dominates the plasma beam (e.g. C2) with the percentage of ions of other species (e.g. C4) minimized, for example below 5%. Application, paragraph 63.

Of exemplary relevance is the use of "uniform" in paragraph 45 which states that the composition and characterization of the protective film are highly dependent on the energy and uniformity of carbon ions striking the deposition surface. Claim 3 recites an ion stream having a uniform impact energy and uniform weight which promotes formation of more than 15% sp3 carbon-carbon bonds. As the composition and characterization of the film are highly dependent on the energy and uniformity of carbon atoms striking the deposition surface, one or ordinary skill in the art would know that "uniformity" of the energy and weight of ions in the stream must be sufficient to promote formation of protective films having more than 15% sp^3 carbon bonds. Thus, describing the energy and weight of the ions of the stream as "uniform" has a **reasonable degree** of particularity and distinctness so that the statutory requirements are met. Applicants respectfully request that this rejection under § 112 be withdrawn.

Claim 3 was also rejected as indefinite as the phrase "straight towards the substrate" is allegedly ambiguous. Applicants respectfully submit that the phrase "straight towards the substrate" provides the requisite reasonable degree of particularity and distinctness. Claim 3 recites "...energizing ions to form a stream...from the plasma straight toward the substrate...." Figs. 3A and 3D show plasma 74 within a plasma beam source which has been energized to travel straight toward substrate 18, 88, as depicted by arrows 72 so that the meaning of energizing the ions to form a stream straight from the plasma toward the substrate is clear. Applicants respectfully request that this rejection under § 112 be withdrawn.

Claim 7 was rejected as indefinite as the phrase "enhancing" is allegedly unclear. Applicants respectfully disagree. Claim 7 recites "A method for enhancing formation of an ion beam...." Applicants respectfully submit that the preamble phrase "for enhancing formation of an ion beam" merely states the intended use of the claimed invention. This intended use is clearly defined by the claimed invention to a reasonable degree of particularity and distinctness,

so that one of ordinary skill would know that "enhancing" of the ion beam is accomplished by "moving a magnetic field through the plasma volume to promote even resonant inductive ionization and homogenize the ion beam" as recited in the claim body. As claim 7 is believed to be clear, Applicants respectfully request that this rejection under § 112 be withdrawn.

OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTIONS BASED ON USPN 5,848,477

Claims 3-5, 7-11 and 16-22 were rejected as allegedly being unpatentable over claims 1-23 of USPN 5,858,477. Claims 3-5 were rejected as allegedly being unpatentable over claims 1-23 of the '477 in view of USPN 5,374,318 (hereinafter " Rabalais"). Applicants have provided herewith a terminal disclaimer with respect to the '477 patent so that these rejections are now moot. Applicants further believe that independent claim 7 and dependent claims 8-11, 18, 21 and 22 are now in condition for allowance.

REJECTION UNDER 35 U.S.C. § 102(b) RABALAIS

Claims 3, 16 and 19-20 were rejected under 35 U.S.C. § 102b as allegedly anticipated by Rabalais. This rejection is respectfully traversed as follows.

Independent claim 3 recites a method for depositing a coating comprising a continuous tetrahedral amorphous carbon on a substrate. The method comprises ionizing a source material so as to form a plasma containing ions which comprise carbon and energizing the ions. In particular, the ions form a stream having a substantially **uniform impact energy** and uniform weight. The ions are energized to form **a stream from the plasma straight toward the substrate**, so that carbon from the ions is deposited on the substrate and which promotes formation of more than 15% sp^3 carbon-carbon bonds. Several of these limitations have not been shown or suggested in Rabalais.

Rabalais discloses a deposition process for diamond films using a mass selection apparatus in which the ions pass through a 60 degree angle electromagnet and a 6 degree condenser so that only a desired species of ion is transmitted. See Fig. 1, col. 12, lines 25-28; col. 14, lines 12-35. Hence, the **deflected** stream of the Rabalais et al. method (required by that device to select desired ion species from a wide variety of particles) is directly contrary to the

plasma stream from the ion source straight toward the substrate recited by independent claim 3. Applicants further note that claim 3 also requires an energized stream of carbon ions having a substantially uniform impact energy and uniform weight. Although Rabalais does describe an ion source with an energy of +/- 1 eV, the ion source and the substrate are on opposite ends of the apparatus. With the method of Rabalais, the ions must first be accelerated, selected with magnetic and condenser fields, and then decelerated. Thus, teaching a uniform ion source energy does not teach a uniform impact energy at the substrate as recited in claim 3.

For the several reasons discussed above, the withdrawal of the § 102 rejection is respectfully requested.

REJECTIONS UNDER 35 U.S.C. §§ 102(e) and 103(a) BALDWIN

Claims 3-5, 16-17 & 20 were rejected under 35 U.S.C. §§ 102(e) and 103(a) as allegedly anticipated or in the alternative as allegedly obvious over USPN 5,616,179 (hereinafter "Baldwin"). Applicants respectfully traverse on both grounds.

The Baldwin patent describes a process for depositing amorphous carbon hydrogenated films on a surface using an end-Hall ion source. First, Baldwin fails to show energizing ions to form a stream having a substantially **uniform impact energy** and **uniform weight** as recited in claim 3. With respect to uniformity of weight, Baldwin describes several species of ions (H^+, H_2^+, CH_x and CH_4*) arising from a feed gas (e.g. methane) without any description of how to select one species of ions, such that the ion stream does not have a uniform weight. Col. 6, lines 34-52. With respect to uniformity of energy, Baldwin teaches that a range of ion energies are produced, including low energy reactive neutral species which are present in such abundance so as to reduce the average energy. Col. 5, lines 25-35. As Baldwin teaches using a "broad beam" to irradiate a substrate "uniformly", this use of uniformity refers to the geometric size of the beam in relation to the substrate, so that "uniformly" does not refer to either the uniform energy of the ions within the stream or uniform weight of the ions in the stream as recited in claim 3. Col. 9, lines 18-21.

Second, Baldwin fails to describe or suggest **an ion stream from the plasma straight toward the substrate** as recited in claim 3. The end-Hall ion source required in the

Baldwin embodiments employs a divergent magnetic field with lines extending toward the substrate, which can cause deflection of the ion stream. Fig. 3 and col. 3, line 10. As Baldwin uses a controlled magnetic field divergence, Baldwin uses the magnetic field to alter the stream of ions traveling from the plasma toward the substrate, so that Baldwin does not describe or suggest an ion stream from the plasma straight toward the substrate as recited in claim 3. **[Nick, can you please confirm this point with respect to the Baldwin magnetic fields?]**

Third, Baldwin fails to describe or suggest promoting formation of **more than 15% sp^3 carbon-carbon bonds**. The Examiner has stated that in order to be diamond like, the deposits of Baldwin would **inherently** include predominantly tetrahedral carbon-carbon bonds. As the Examiner well knows, to establish inherency the extrinsic evidence must make clear that the missing descriptive matter is **necessarily present** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. MPEP 2112, In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51

Baldwin does discuss three fold planar bonding (sp^2 hybridization) and tetrahedral carbon bonds (sp^3 hybridization), and specific examples of each, namely graphite and diamond, respectively. Col. 2, lines 5-12. However, Baldwin makes reference to diamond as an **example** of a tetrahedral sp^3 bonding pattern. Because diamond is merely an example of a tetrahedral sp^3 bonding pattern, other tetrahedral sp^3 bonding patterns besides sp^3 carbon-carbon bonds can be formed with carbon, for example carbon-hydrogen sp^3 bonding patterns. Thus, the addition of hydrogen gas to avoid the formation of graphite (i.e. sp^2) bonds can result in the formation of carbon-hydrogen sp^3 bonds. Col. 9, lines 50 to 59. Further, Baldwin describes numerous ion species used to form the film (e.g. H^+, H_2^+, CH_x and CH_4*) which can effect the regularity of the bonding pattern. Col. 6, lines 34-47. For example, Baldwin states that the film formed is **twice as thick** as that which is to be expected from the ion current. Col. 6, lines 31-35. Thus, the Examiner's reliance on the addition of hydrogen and "diamond like" properties fails to show that

at least 15% (or for that matter any percentage) of sp^3 carbon-carbon bonds are **necessarily present** in the Baldwin films.

As all of the elements recited in claim 3 have not been taught or suggested in Baldwin, Applicants respectfully request that these rejections be withdrawn.

REJECTION UNDER 35 U.S.C. § 103(a) LEWIN IN COMBINATION WITH BALDWIN OR RABALAIS

Claims 3, 5 & 19-20 were rejected as allegedly obvious under § 103 over USPN 4,486,286 (hereinafter "Lewin") in combination with Baldwin or Rabalais. Applicant's respectfully disagree. Several elements recited in claim 3 are not described or suggested in either the Baldwin or Rabalais references as set forth above, and Lewin similarly fails to describe the missing claim elements, specifically: energizing ions to form a stream having a substantially **uniform impact energy** and **uniform weight**; **an ion stream from the plasma straight toward the substrate**; and promoting formation of **more than 15% sp3 carbon-carbon bonds** as recited in claim 3. As such, Applicants request withdrawal of this final § 103 rejection and allowance of claim 3 and dependent claims 4, 5, 16, 17, 19, and 20.

OBVIOUSNESS-TYPE DOUBLE PATENTING ASSIGNEE GUARDIAN INDUSTRIES

Claim 3 was rejected under the judicially created doctrine of obviousness-type double patenting (hereinafter "ODP") as allegedly being unpatentable over USPN's 6,826,977 and 6,663,753; claims 3 and 6 were rejected as allegedly unpatentable over the '753 patent in view of Rabalais; claims 3 and 5 were rejected as allegedly unpatentable over USPN 6,764,579; claims 3 and 5 were rejected as allegedly unpatentable over USPN 6,416,816; claims 3 and 5 were rejected as allegedly unpatentable over the '816 patent in view of Rabalais; claim 4 was rejected as allegedly unpatentable over the '977 patent or the '753 patent or the '579 patent or the '816 patent in view or Rabalais or Baldwin; Claim 3 was provisionally rejected over co-pending U.S. Application No. 10/359,298, now USPN 6,878,404. Applicants respectfully traverse. Obviousness-type double patenting requires either common ownership or a joint research agreement as set forth in 35 U.S.C. 103(c)(2) and (3). MPEP § 804. Applicants submit that

there is no common ownership and no joint research agreement between United Module Corporation and Guardian Industries.

The chain of title shows that the owner of the present application is United Module Corporation. The present application is a divisional of and claims the benefit of priority from U.S. Patent Application No. 10/354,336, filed January 29, 2003, which is a divisional of and claims the benefit of priority from U.S. Patent Application No. 09/648,341, filed August 25, 2000, which is a continuation of U.S. Patent Application No. 09/165,513, filed October 2, 1998, which is a divisional of U.S. Patent Application No. 08/761,336, now U.S. Patent No. 5,858,477 filed December 10, 1996, which is a continuation-in-part of and claims priority from U.S. Provisional Patent Applications Serial No. 60/018,793, filed May 31, 1996, and Serial No. 60/018,746, filed May 31, 1996. Parent U.S. Patent Application No. 08/761,336, now U.S. Patent No. 5,858,477, filed December 10, 1996, was assigned to Akashic Memories Corporation as recorded on 05/09/1999, Reel/Frame 8569/0800; a copy of this assignment is attached herewith as Exhibit A. All rights which Akashic had in the '477 patent were assigned to the present owner, United Module Corporation, on 03/30/2001, Reel/Frame: 011700/0202, by court order, a copy of this assignment is attached herewith attached herewith as Exhibit B. As the present application is the child of continuation and divisional patent applications based on the '477 patent, which were all assigned to United Module Corporation, the owner of the present application is United Module Corporation.

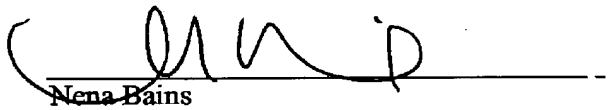
Because the United Module Corporation is the assignee of the present application and Guardian Industries Corp. is the assignee of the '977 patent, the '753 patent, the '579 patent, the '816 patent and the '404 patent, there is no common ownership. Applicants also note that the present application has an effective filing date of least December 10, 1996 (filing date of the 08/761,336 application) so that none of the Guardian Industries Corp. patents listed above can be considered prior art. Applicants respectfully request that the obviousness-type double patenting rejections be withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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